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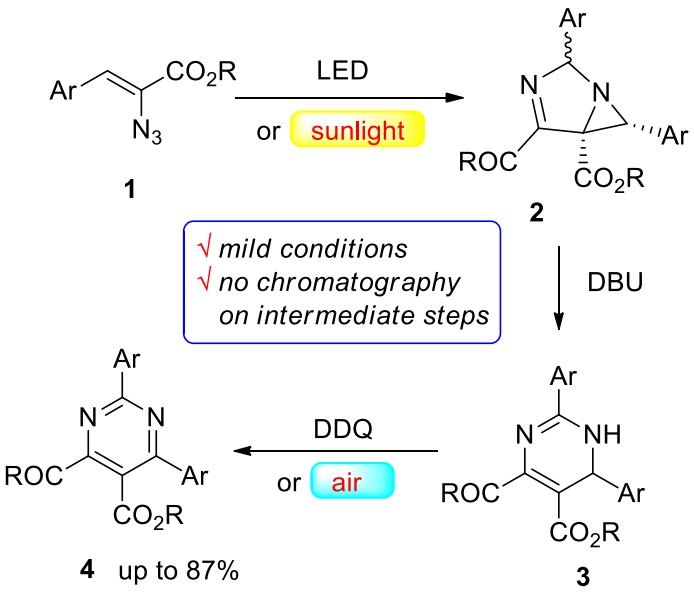
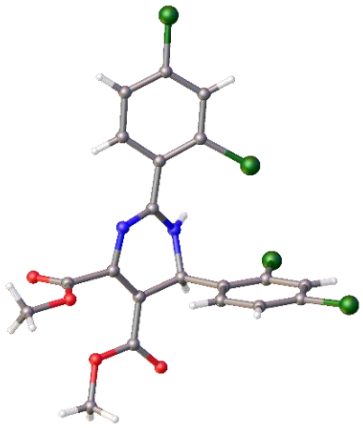
# VINYL AZIDE STRATEGY FOR THE SYNTHESIS OF TETRASUBSTITUTED PYRIMIDINES*

**Keywords:** vinyl azides, photocatalysis, pyrimidine.

Pyrimidines are one of the most important azaheterocycles for the biological and pharmaceutical fields. In particular, a pyrimidine core is present in natural compounds such as thiamine (vitamin B) and nucleobase adenine. The pyrimidine derivatives display various types of bioactivity, therefore new simple methods for the synthesis of multisubstituted pyrimidine, especially those having an uncommon substitution pattern, are still necessary and are actively being developed [1, 2].

In our research group, a new preparative procedure for the synthesis of tetrasubstituted pyrimidine derivatives from α-azidocinnamates was developed. The synthesis consists of the following stages: (*i*) LED light induced dimerization of α-azidocinnamates to 1,3-diazabicyclo[3.1.0]hex-3-enes *via* formation of 2*H*-azirines, (*ii*) DBU-catalyzed isomerization of 1,3-diazabicyclo[3.1.0]hex-3-enes to 1,6-dihydropyrimidines, (*iii*) aromatization of 1,6-dihydropyrimidines using DDQ.



X-ray of dihydropyrimidine

It is important to note that in our synthesis no chromatographic purification on the intermediate steps is needed. In addition, a successful use of sunlight as irradiator and air as an oxidant was demonstrated.

1,6-Dihydropyrimidines **3** and pyrimidines **4** were characterized by high resolution $ESI^+$-MS, $^1H$ and $^{13}C\{^1H\}$ NMR spectroscopy. In addition, the structure of one of dihydropyrimidines was elucidated by a single-crystal X-ray diffraction.

**References**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2. *Mondal R., Sinha S., Das S. et al.* // Advanced Synthesis and Catalysis. 2020. Vol. 362. P. 594–600.



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## MECHANISM OF STRUCTURAL NETWORKING IN BIOACTIVE SILICON–ZINC–BORON-GLYCEROL HYDROGEL*


**Keywords**: sol–gel synthesis, silicon–zinc–boron-glycerol hydrogel, nanoscale structure, mechanism, antimicrobial activity.


Using the sol–gel process, we early synthesized bioactive element-containing hydrogel based on silicon, zinc, and boron glycerolates as biocompatible precursors [1]. It was shown that silicon–zinc–boron-glycerol hydrogel (Si-Zn-B–gel) is